

## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Date: 23-04-2018

Lab ID : CP-2018-04-02-22  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattengare Palya, Near Prashantnagara, Bangalore  
Customer's Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 20-04-2018  
Sample ID No : 2018-04-02-22 /01  
Sample Type : Birla Super 53grade  
Reference to BIS codes : IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,  
IS 4031 (Part 1,2,3,4,5, 6,11):1988  
IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4  
IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5  
IS 4031 Part 3, Determination of Soundness, Clause 5, Clause 6  
IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5  
IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5  
IS 4031 Part 11, DETERMINATION OF DENSITY , Clause 6

Date of test : 21-04-2018

Environmental Conditions during test :

Temperature: 26°C  
Humidity: 72%

| SL.No. | Physical properties                                        | Results     | Requirement as per IS 12269: 2013 |
|--------|------------------------------------------------------------|-------------|-----------------------------------|
| 1      | Fineness by dry sieving (%)                                | 3.05        | —                                 |
| 2      | Finess by Air permeability method (m <sup>2</sup> /kg.Min) | 287.5       | 225m <sup>2</sup> /kg, Min        |
| 3      | Density (gm/cc)                                            | 3.13        | —                                 |
| 4      | Standard Consistency (%)                                   | 29.0%       | Not specified                     |
| 5      | Initial Setting time                                       | 160 minutes | Not less than 30 minutes          |
| 6      | Final Setting time                                         | 290 minutes | Not more than 600 minutes         |
| 7      | Soundness (Le Chatelier's Method)                          | 1.5mm       | Not more than 10 mm               |

**Note:**

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## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Date: 19-05-2018

Lab ID : CP-2018-04-02-22  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore  
Customer's Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 20-04-2018  
Sample ID No : 2018-04-02-22 /01  
Sample Type : Birla Super 53grade  
Reference to BIS codes : IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,  
IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5  
IS 4031 Part 6, Determination of Compressive Strength, Clause 6  
Date of test : 21-04-2018  
Environmental Conditions during test : Temperature: 26°C  
Humidity: 72%

### Compressive Strength

| Sl.No. | Physical properties | Results               | Requirement as per IS 12269: 2013  |
|--------|---------------------|-----------------------|------------------------------------|
| 1      | 3 Days              | 30.5N/mm <sup>2</sup> | Not less than 27 N/mm <sup>2</sup> |
| 2      | 7 Days              | 39.5N/mm <sup>2</sup> | Not less than 37 N/mm <sup>2</sup> |
| 3      | 28 Days             | 57.5N/mm <sup>2</sup> | Not less than 53 N/mm <sup>2</sup> |

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## TEST REPORT ON COARSE AGGREGATES

Lab ID : CP-2018-04-02-22 Date: 23-04-2018  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattagare Palya, Near Prashantnagara, Bangalore  
Customer's Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample condition : Satisfactory  
Date of Receipt : 20-04-2018  
Sample ID No : 2018-04-02-22 /02(a)  
Sample Type : 40mm down size coarse aggregate  
Reference to BIS codes : IS: 383:2016 (Specification for Coarse and fine Aggregates )  
IS: 2386 :1963(Part - 1,3,4) RA2011  
IS 2386 Part 1: Particle Size and Shape  
IS 2386 Part 3: Specific gravity, Density, Voids, Water Absorption  
IS 2386 Part 4: Mechanical Properties  
Date of test : 20-04-2018

### SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|------------|-----------|------------------------|-----------------------------------|------------------------------|-----------|-----------------------------|
| 1          | 80 mm     | 0                      | 0                                 | 0.0                          | 100       | 100                         |
| 2          | 40 mm     | 1215                   | 1215                              | 8.1                          | 91.9      | 90-100                      |
| 3          | 20 mm     | 5320                   | 6535                              | 43.6                         | 56.4      | 30-70                       |
| 4          | 10 mm     | 6255                   | 12790                             | 85.3                         | 14.7      | 10-35                       |
| 5          | 4.75 mm   | 1637                   | 14427                             | 96.2                         | 3.8       | 0-5                         |
| 6          | Pan       | 573                    | 15000                             | 100.0                        | 0         | ---                         |



## TEST REPORT OF CEMENT CONCRETE CUBES

Date: 30/05/2018

Lab ID : CP-2018-04-10-09  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattigara Palya, Near Prashantnagara, Bangalore  
Customer's Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 04-05-2018  
Sample ID No : 2018-04-10-09 /02  
Customer ID : M20 Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 28 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 30/05/2018

| SL No. | Identification Mark | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen (mm) | Cross sectional area (Sq.mm) | Weight of the sample (kg) | Failure Load (KN) | Compressive strength (N/mm <sup>2</sup> ) | Average Compressive Strength (N/mm <sup>2</sup> ) |
|--------|---------------------|-------------------|-----------------|-----------------|--------------------------------|------------------------------|---------------------------|-------------------|-------------------------------------------|---------------------------------------------------|
| 1      | M20 Concrete        | M20               | 02/05/2018      | 30/05/2018      | 150.09 X<br>151.44 X<br>149.76 | 22729                        | 8.138                     | 479.7             | 21.1                                      | 21.4                                              |
| 2      | M20 Concrete        | M20               | 02/05/2018      | 30/05/2018      | 151.38 X<br>150.36 X<br>149.59 | 22761                        | 8.376                     | 506.2             | 22.2                                      |                                                   |
| 3      | M20 Concrete        | M20               | 02/05/2018      | 30/05/2018      | 150.07 X<br>150.29 X<br>149.89 | 22554                        | 8.175                     | 469.3             | 20.8                                      |                                                   |

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Quality Manager





## TEST RESULTS OF GRADATION FOR WMM

Lab ID : CP-RW-2018-04-11-10 Date: 07-05-2018  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegar Palya, Near Prashantnagara, Bangalore  
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 05-05-2018  
Sample ID No : 2018-04-11-10/01  
Type of Mix : WMM ( Wet Mix Macadam)  
Date of test : 05-05-2018  
Oven Dry Weight : 11000 Grams

| IS Sieve Size(mm) | Weight Retained (gm) | Cumulative Weight Retained (gm) | % Cumulative Weight Retained | % Passing | Spec.I.Vide Table 400.13 MORTH Specification |
|-------------------|----------------------|---------------------------------|------------------------------|-----------|----------------------------------------------|
| 53                | 0                    | 0                               | 0.0                          | 100.0     | 100                                          |
| 45                | 332                  | 332                             | 3.0                          | 97.0      | 95-100                                       |
| 22.4              | 2174                 | 2506                            | 22.8                         | 77.2      | 60-80                                        |
| 11.2              | 2066                 | 4572                            | 41.6                         | 58.4      | 40-60                                        |
| 4.75              | 2424                 | 6996                            | 63.6                         | 36.4      | 25-40                                        |
| 2.36              | 1762                 | 8758                            | 79.6                         | 20.4      | 15-30                                        |
| 0.6               | 548                  | 9306                            | 84.6                         | 15.4      | 8-22                                         |
| 0.075             | 1250                 | 10556                           | 96.0                         | 4.0       | 0-5                                          |

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**TEST REPORT OF AGGREGATE IMPACT VALUE**  
**IS: 2386 Part IV**

Date: 07-05-2018

Lab ID : CP-RW-2018-04-11-10  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegar Palya, Near Prashantnagara, Bangalore  
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 05-05-2018  
Sample ID No : 2018-04-11-10/01  
Type of Mix : Coarse Aggregate for WMM ( Wet Mix Macadam)  
Date of test : 05-05-2018

| SLNo | Particulars of observations                                                                                                                 | Index      | TEST 1 | TEST 2 |
|------|---------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|--------|
| 1    | Total weight of the surface dry sample (passing 12.5 mm and retained on 10mm sieve)                                                         | A          | 315.0  | 315.0  |
| 2    | Weight of fraction passing 2.36mm sieve After giving 15 blows                                                                               | B          | 72.9   | 74.0   |
| 3    | weight of fraction retained 2.36mm sieve After giving 15 blows                                                                              | C          | 241.7  | 240.4  |
| 4    | Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made. | A-(B+C)    | 0.4    | 0.6    |
| 5    | Aggregate impact value                                                                                                                      | (B/A)*100  | 23.1   | 23.5   |
| 6    | Aggregate impact value ( Mean of two tests)                                                                                                 | Percentage | 23.3   |        |

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**DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE (IS 2386 (Part 1) 1963 (RA 2007))**

Lab ID : CP-RW-2018-04-11-10 Date: 07-05-2018  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattagare Palya, Near Prashantnagara, Bangalore  
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 05-05-2018  
Sample ID No : 2018-04-11-10/01  
Type of Mix : Coarse Aggregate for WMM ( Wet Mix Macadam)  
Date of test : 05-05-2018

**Result:**

| Index                                           | Percentage of Flakiness and Elongation Index | Secified limits as per MORTH specification table 400-12      |
|-------------------------------------------------|----------------------------------------------|--------------------------------------------------------------|
| Flakiness Index                                 | 13.7%                                        | Combined Flakiness & Elongation Index for WMM is Maximum 35% |
| Elongation Index                                | 12.6%                                        |                                                              |
| Combined Flakiness and Elongation Index for WMM | 26.3%                                        |                                                              |

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## TEST RESULTS OF GRADATION FOR DBM (IS 2386:(Part 1) 1963 (RA2011))

Lab ID : CP-RW-2018-04-27-15 Date: 19-05-2018

Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.

Address : Yelahanka Sub Division, BBMP, Bangalore.

Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.

Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore

Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 17-05-2018

Sample ID No : 2018-02-13-02/01

Type of Mix : DBM-Plant (Dense Bituminous Macadam)

Date of test : 17-05-2018

Weight of Sample : 5000 Grams

| IS Sieve Size (mm) | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Specification Limits as per MORTH specification Table 500-10 (grading -2) |
|--------------------|----------------------|---------------------------------|--------------------------|-------------------------|---------------------------------------------------------------------------|
| 37.5               | 0                    | 0                               | 0                        | 100                     | 100                                                                       |
| 26.5               | 172                  | 172                             | 3.44                     | 96.56                   | 90-100                                                                    |
| 19                 | 1013                 | 1185                            | 23.70                    | 76.30                   | 71-95                                                                     |
| 13.2               | 520                  | 1705                            | 34.10                    | 65.90                   | 56-80                                                                     |
| 4.75               | 1150                 | 2855                            | 57.10                    | 42.90                   | 38-54                                                                     |
| 2.36               | 710                  | 3565                            | 71.30                    | 28.70                   | 28-42                                                                     |
| 0.3                | 1064                 | 4629                            | 92.58                    | 7.42                    | 7-21                                                                      |
| 0.075              | 252                  | 4881                            | 97.62                    | 2.38                    | 2-8                                                                       |
| PAN                | 119                  | 5000                            | 0.00                     | 0                       | 0                                                                         |

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## PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID : CP-RW-2018-04-27-15 Date: 21-05-2018  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore  
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 17-05-2018  
Sample ID No : 2018-02-13-02/01  
Type of Mix : DBM (Dense Bituminous Macadam)  
Date of test : 17-05-2018

Table 500-6 : Physical Requirements for Coarse Aggregate for Dense Bituminous Macadam

| Property         | Test                   | Result | Specification                                                | Method of Test   |
|------------------|------------------------|--------|--------------------------------------------------------------|------------------|
| Partical Shape   | Flakiness Index        | 10     | Combined Flakiness & Elongation Index for DBM is Maximum 35% | IS:2386 Part I   |
|                  | Elongation Index       | 9      |                                                              |                  |
| Strength         | Aggregate Impact Value | 22     | Maximum 30%                                                  | IS:2386 Part IV  |
| Specific gravity | Specific gravity       | 2.58   | Maximum 2.7                                                  | IS:2386 Part III |
| Water Absorption | Water Absorption       | 0.38   | Maximum 2%                                                   | IS:2386 Part III |

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### TESTS RESULTS ON STABILITY OF MIX

Lab ID : CP-RW-2018-04-27-15 Date: 21-05-2018  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore  
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Hot Mix Plant, Bangalore  
Sample Condition : Satisfactory  
Date of Receipt : 17-05-2018  
Sample ID No : 2018-02-13-02/01  
Type of Mix : DBM (Dense Bituminous Macadam)  
Date of test : 17-05-2018

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

| SLNo | Particulars of observations               | TEST 1 | TEST 2 | Secified limits as per MORTH specification table 500-11 |
|------|-------------------------------------------|--------|--------|---------------------------------------------------------|
| 1    | Marshal Stability at 60°C, KN             | 11.29  | 11.82  | 9KN(Min)                                                |
| 2    | Marshal flow at 60°C, mm                  | 3.54   | 3.87   | 2-4                                                     |
| 3    | Percent air Voids                         | 4.56   | 4.17   | 3-5                                                     |
| 4    | Percent Voids in mineral Aggregate(VMA %) | 14.54  | 14.76  | 13-15                                                   |
| 5    | Percent Voids filled with Bitumen(VFB %)  | 68.98  | 70.28  | 65-75                                                   |
| 6    | Density, g/cc                             | 2.42   | 2.40   | -                                                       |

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**TEST RESULTS OF GRADATION FOR BC  
IS 2386 (Part 1) 1963 (RA 2011 )**

Lab ID : CP-RW-2018-04-28-10 Date: 06-06-2018

Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.

Address : Yelahanka Sub Division, BBMP, Bangalore.

Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.

Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore

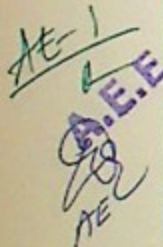
Customer Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18

Source of Sample : Sample supplied by Agency

Date of Receipt : 04-06-2018

Type of Mix : BC (Bituminous Concrete)

Date of test : 04-06-2018



| Sl.no | Description                           | Index                           | Trail 1 | Trail 2 |
|-------|---------------------------------------|---------------------------------|---------|---------|
| 1     | Weight of the Sample                  | A                               | 507     | 507     |
| 2     | Weight of the sample After extraction | B                               | 475     | 476     |
| 3     | Bitumen percentage                    | $\frac{A-B}{A} \times 100$<br>A | 6.31    | 6.11    |
| 4     | Average percentage                    | %                               | 6.2     |         |

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## TEST REPORT ON BITUMEN

Date: 14-05-2018

Lab ID : CP-2018-04-09-14  
Customer : Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.  
Address : Yelahanka Sub Division, BBMP, Bangalore.  
Project Name : Construction of Magic Box at Kempegowda circle and Improvements around the kempegowda statue in ward No-01 of Yelahanka Sub Division.  
Agency : Sri.H.S.Palakshamurthy, No:1,2nd Main B.D.A layout, Pattegare Palya, Near Prashantnagara, Bangalore  
Customer's Reference : EE(YNK.D)E-PMT-02/W.O/80/2017-18  
Source of Sample : Sample supplied by Agency  
Sample Condition : Satisfactory  
Date of Receipt : 12-05-2018  
Sample ID No : 2018-04-09-14/01  
Sample Type : Bitumen  
Reference to BIS codes : IS: 1201-1220(1978) (Reaffirmed-2004)  
Date of test : 12-05-2018

### Test Results

| Sl.no | Name of Test                      | Result | Requirements as per IS: 1201-1220 |
|-------|-----------------------------------|--------|-----------------------------------|
| 1     | Penetration at 25°C, in 1/10th mm | 66     | 60 to 70                          |
| 2     | Softening Point, °C               | 48.2   | Min. 40°C                         |
| 3     | Ductility, cm                     | 96     | Min. 75cm                         |
| 4     | Flash point, °C                   | 232    | Min. 220°C                        |
|       | Fire point, °C                    | 248    |                                   |

#### Note:

The results pertain to the samples received and tested.  
All information furnished by Customer/Representative  
Any correction in the report will make this report invalid  
This report without prior written approval should not be reproduced or published in full or part.  
Samples will be disposed after 90 days from the date of issue of test certificate

FOR CIVIL PRO.

R KARTHIK RECHAN  
Authorized Signatory  
Quality Manager

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\*\*\*\*End of Report\*\*\*\*



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